**3GPP TSG-SA4 Meeting #134 *S4-252115***

**Dallas, United States, 17th Nov 2025 - 21st Nov 2025 revision of S4-251837**

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| *CR-Form-v12.4* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **26.114** | **CR** | **0599** | **rev** | **1** | **Current version:** | **18.11.0** |  |
|  | | | | | | | | |
| *For* [***HELP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*https://www.3gpp.org/Change-Requests*](https://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network |  | Core Network | **x** |

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| ***Title:*** | Corrections to b=AS calculations and SDP examples for IVAS | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia | | | | | | | | | |
| ***Source to TSG:*** | S4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | IVAS\_Codec | | | | |  | ***Date:*** | | | 2025-11-20 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The b=AS bandwidth calculations for IVAS does not include the RTP payload header size. All the IVAS specific SDP parameters are not covered in the current examples. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | The RTP payload header is included in the b=AS calculations for IVAS. Examples are added for IVAS SDP offer/answer and existing example is fixed. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The b=AS for IVAS would be calculated incorrectly. The use of the IVAS SDP parameters and session negotiation would not be so clear. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | A.19, Z.2, Z.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **x** |  | Other core specifications | | | | TS 26.253 CR 0016 | | |
| ***affected:*** | |  | **x** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | Depends on TS 26.253 CR 0016. Relates to TS 26.114 CR 0587. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | Rev1: update cover page | | | | | | | | |

==============First change==============

# A.19 SDP offers and answers for speech sessions with IVAS

These examples show SDP offers and answers for speech sessions where IVAS is negotiated. These SDP offer and answer examples are designed to highlight the respective area that is being described and should therefore not be considered as complete SDP offers and answers.

## A.19.1 SDP offers initiated by MTSI client in terminal

The SDP offers below can be used by MTSI client in terminal, depending on the access technology or the number of audio channels.

### A.19.1.1 Unknown access technology

When the access technology is unknown to MTSI client in terminal, the SDP offer below can be used to initiate a speech session. In this example, RTP Payload Type 96 is defined for IVAS, RTP Payload Type 97 is defined for EVS, and two sets of RTP Payload Types, 98 and 99, and 100 and 101 are defined for AMR-WB and AMR respectively.

Table A.19.1: SDP example

|  |
| --- |
| SDP offer |
| m=audio 49152 RTP/AVP 96 97 98 99 100 101  a=tcap:1 RTP/AVPF  a=pcfg:1 t=1  b=AS:549  b=RS:0  b=RR:2000  a=rtpmap:96 IVAS/16000  a=fmtp:96 cf-send=OSBA,OMASA,MC,ISM,MASA,SBA,Stereo; ibr=13.2-512; pi-types=fsco,fdoc,fdou,face; pi-br=10; max-red=220  a=rtpmap:97 EVS/16000/1  a=fmtp:97 max-red=220  a=rtpmap:98 AMR-WB/16000/1  a=fmtp:98 mode-change-capability=2; max-red=220  a=rtpmap:99 AMR-WB/16000/1  a=fmtp:99 mode-change-capability=2; max-red=220; octet-align=1  a=rtpmap:100 AMR/8000/1  a=fmtp:100 mode-change-capability=2; max-red=220  a=rtpmap:101 AMR/8000/1  a=fmtp:101 mode-change-capability=2; max-red=220; octet-align=1  a=ptime:20  a=maxptime:240 |

**Comments:**

The MTSI client in terminal IVAS with up to 512 kbps and all EVS codecs modes, for both sending and receiving directions. For IVAS, all audio bandwidths from wideband to fullband are offered but no parameter is needed since this is default when the ibw parameter is not included. PI data for scene orientations, device orientations (compensated and uncompensated) and acoustic environment is also offered for both directions with up to 10 kbps. All audio bandwidths are allowed for both IVAS and EVS. For the EVS mode in IVAS, all EVS configuration parameters use their default values.

The clock rate of IVAS is set to 16 kHz.

The media level bandwidth (b=AS) is calculated for the highest offered bitrate of IVAS, 512 kbps, and adding 2.4 kbps for IVAS payload header, and including 10 kbps for PI data, and then adding 24 kbps for IPv6 overhead, and then rounding up to the nearest integer, resulting in 549 kbps.

## A.19.2 SDP answers from MTSI client in terminal

The SDP answers below can be used by MTSI client in terminal, depending on access technology or service policy. It is assumed that an SDP offer such as described in Table A.19.1 is received.

### A.19.2.1 SDP answer from MTSI client in terminal when IVAS is negotiated

In this example, the MTSI client in terminal includes only the IVAS codec in the SDP answer.

Table A.19.2: SDP example

|  |
| --- |
| SDP answer |
| m=audio 49152 RTP/AVPF 96  a=acfg:1 t=1  b=AS:165  b=RS:0  b=RR:2000  a=rtpmap:96 IVAS/16000  a=fmtp:96 cf-recv=Stereo; ibr=128; pi-types=fsco,fdoc,fdou,face; pi-br=10; max-red=220  a=ptime:20  a=maxptime:240 |

**Comments:**

For IVAS, stereo at 128 kbps is selected for the session, while all other the configuration parameters are the same as in the received SDP offer.

The media level bandwidth (b=AS) is calculated by adding 128 kbps for IVAS, 2.4 kbps for IVAS payload header, 10 kbps for PI data, adding 24 kbps for IPv6 and rounding up to the nearest integer.

## A.19.3 Further examples for SDP offers and answers

### A.19.3.1 Starting a session with EVS

Table A.19.3.1: SDP example

|  |
| --- |
| SDP offer |
| m=audio 49152 RTP/AVP 96 97 98  a=tcap:1 RTP/AVPF  a=pcfg:1 t=1  b=AS:154  b=RS:0  b=RR:2000  a=rtpmap:96 IVAS/16000  a=fmtp:96 cf-send=OSBA,OMASA,MC,ISM,MASA,SBA,Stereo; ibr=13.2-128; mono-init=1; evs-mode-switch=0; br=5.9-48; max-red=220;  a=rtpmap:97 EVS/16000/1  a=fmtp:97 max-red=220  a=rtpmap:98 AMR-WB/16000/1  a=fmtp:98 mode-change-capability=2; max-red=220  a=ptime:20  a=maxptime:240 |
| **SDP answer** |
| m=audio 49152 RTP/AVPF 96  a=acfg:1 t=1  b=AS:122  b=RS:0  b=RR:2000  a=rtpmap:96 IVAS/16000  a=fmtp:96 cf-recv=Stereo,MASA,SBA; cf-send=Stereo,ISM; ibr=13.2-96; mono-init=1; evs-mode-switch=0; br=5.9-48; max-red=220;  a=ptime:20  a=maxptime:240 |

**Comments:**

The offer includes multiple immersive formats with a bitrate range of 13.2 to 128 kbps. The mono-init parameter is set to 1 indicating to use EVS at the start of the session. The evs-mode-switch parameter is set to 0 to indicate to use EVS Primary mode at the start of the session. EVS bitrate range of 5.9 to 48 kbps is offered with the br parameter.

The media level bandwidth (b=AS) for the offer is calculated by adding 128 kbps for IVAS, 2 kbps for IVAS payload header (excluding PI data indication bits), adding 24 kbps for IPv6 and rounding up to the nearest integer.

The answer includes the selected immersive formats in the receive direction (Stereo, MASA, SBA) and also indicates the formats used in the send direction (Stereo, ISM). The bitrate range is lowered to 13.2 to 96 kbps. The mono-init, evs-mode-switch and br parameters are mirrored in the answer. The session will start with the EVS Primary mode.

The media level bandwidth (b=AS) for the answer is calculated by adding 96 kbps for IVAS, 2 kbps for IVAS payload header (excluding PI data indication bits), adding 24 kbps for IPv6 and rounding up to the nearest integer.

### A.19.3.2 Sub-format, initial codec mode and initial noise suppression mode

Table A.19.3.2: SDP example

|  |
| --- |
| SDP offer |
| m=audio 49152 RTP/AVP 96 97 98  a=tcap:1 RTP/AVPF  a=pcfg:1 t=1  b=AS:156  b=RS:0  b=RR:2000  a=rtpmap:96 IVAS/16000  a=fmtp:96 cf-send=OMASA; cf-sub-info=ISM4\_MASA\_2TC; ibr=32-128; ibw=fb; ns-mode-init-send=’def’,’min’; pi-types=fdas,rdas; pi-br=2; max-red=220;  a=rtpmap:97 EVS/16000/1  a=fmtp:97 max-red=220  a=rtpmap:98 AMR-WB/16000/1  a=fmtp:98 mode-change-capability=2; max-red=220  a=ptime:20  a=maxptime:240 |
| **SDP answer** |
| m=audio 49152 RTP/AVPF 96  a=acfg:1 t=1  b=AS:156  b=RS:0  b=RR:2000  a=rtpmap:96 IVAS/16000  a=fmtp:96 cf-recv=OMASA; cf-send=ISM,SBA; ivas-icm-send=ISM4:64:fb; ibr=64-128; ibw=fb; ns-mode-recv=’def’; pi-types=fdas,rdas; pi-br=2; max-red=220;  a=ptime:20  a=maxptime:240 |

**Comments:**

The offer includes a single immersive format (OMASA) with an indicated sub-format (ISM4 MASA 2TC) in the cf-sub-info parameter. The offer includes a single bandwidth to be used (fullband) which restricts the available bitrate range for the offered format/sub-format combination to be equal to or above 32 kbps. The bitrate range is offered as 32 to 128 kbps. Initial noise suppression modes of default and minimum are offered. PI data types for dynamic audio suppression are offered and the bitrate for the PI data is set to 2 kbps.

The media level bandwidth (b=AS) for the offer is calculated by adding 128 kbps for IVAS, 1.2 kbps for IVAS payload header (excluding bandwidth, format and sub-format request bits), adding 2 kbps for PI data, adding 24 kbps for IPv6 and rounding up to the nearest integer.

The answer mirrors the received coded format. The answer indicates their coded formats in the send direction (ISM, SBA) and also indicates their initial codec mode to be used at the start of the session with the ivas-icm-send parameter (ISM4 sub-format, 64 kbps bitrate and fullband). The bitrate range is adjusted to 64 to 128 kbps in order to fulfil the requirement for ISM4 fullband operation which requires a bitrate of 64 kbps or above. The default initial noise suppression mode in the receiving direction is selected in the answer.

The media level bandwidth (b=AS) for the answer is calculated by adding 128 kbps for IVAS, 2 kbps for IVAS payload header (excluding bandwidth request bits), adding 2 kbps for PI data, adding 24 kbps for IPv6 and rounding up to the nearest integer.

### A.19.3.3 Split rendering session

Table A.19.3.3: SDP example

|  |
| --- |
| SDP offer |
| m=audio 49152 RTP/AVP 96 97 98  a=tcap:1 RTP/AVPF  a=pcfg:1 t=1  b=AS:80  b=RS:0  b=RR:2000  a=rtpmap:96 IVAS/16000  a=fmtp:96 cf-send=SR; sr-dof=3; sr-tc=LCLD,384; pi-types=rhor,rlip; pi-br=6; max-red=220; ibr-recv=13.2-48  a=rtpmap:97 EVS/16000/1  a=fmtp:97 max-red=220  a=rtpmap:98 AMR-WB/16000/1  a=fmtp:98 mode-change-capability=2; max-red=220  a=ptime:20  a=maxptime:240 |
| **SDP answer** |
| m=audio 49152 RTP/AVPF 96  a=acfg:1 t=1  b=AS:417  b=RS:0  b=RR:2000  a=rtpmap:96 IVAS/16000  a=fmtp:96 cf-recv=SR; sr-dof=3; sr-tc=LCLD,384; pi-types=rhor,rlip; pi-br=6; cf-send=SBA,ISM,MASA,Stereo; ibr-send=13.2-48; max-red=220;  a=ptime:20  a=maxptime:240 |

**Comments:**

The split rendering session offer includes a single coded format (SR) in the cf parameter. The degrees of freedom parameter sr-dof is set to 3. With the sr-tc parameter, the SR codec format is set to LCLD with up to 384 kbps bitrate. PI types for head orientations and listener position are offered with 6 kbps reserved for the PI data. The bitrate in the receiving direction is set to a range of 13.2 to 48 kbps.

The media level bandwidth (b=AS) for the offer is calculated by adding 48 kbps for IVAS, 2 kbps for IVAS payload header (including ToC, initial E byte, bandwidth change requests, PI indication and split rendering requests), adding 6 kbps for PI data, adding 24 kbps for IPv6 and rounding up to the nearest integer. The format and sub-format request bits are excluded because the send direction is operating only in split rendering mode.

The answer mirrors the split rendering and PI parameters. The answer includes the coded formats (SBA, ISM, MASA, Stereo) and the bitrate range of 13.2 to 48 kbps for their send direction.

The media level bandwidth (b=AS) for the answer is calculated by adding 384 kbps for SR IVAS, 2.8 kbps for SR IVAS payload header (including 2xToC, initial E byte, bandwidth change requests, PI indication, format and sub-format change requests), adding 6 kbps for PI data, adding 24 kbps for IPv6 and rounding up to the nearest integer.

==============Next change==============

Annex Z (informative):  
Computation of b=AS for IVAS

# Z.1 General

This annex contains examples of computing b=AS for the IVAS codec when ptime=20. In these examples, it is assumed that no extra bandwidth is allocated for redundancy.

# Z.2 Procedure for computing the bandwidth

The bandwidth is calculated using the following procedure when no extra bandwidth is allocated for redundancy:

1) Use the highest negotiated bitrate for the IVAS codec included in the SDP. Use ibr or ibr-recv parameters, if specified.

2) Calculate bitrate for the RTP payload header, see below.

3) Add bandwidth needed for PI data. Use pi-br or pi-br-recv parameters, if specified.

4) Add bandwidth needed for IP, UDP and RTP headers assuming 50 frames per second: 16 kbps for IPv4 and 24 kbps for IPv6.

5) Add bandwidth needed for RTCP.

6) The b=AS bandwidth is the sum of the above listed bitrates after rounding up to nearest integer kbps.

If the SDP includes multiple codecs and/or configurations, the bandwidth is calculated for each configuration and the b=AS bandwidth is set to the highest of the bandwidths.

# Z.3 Computation of IVAS RTP payload header bitrate

## Z.3.1 Payload header bitrate for regular (non-SR) session

The RTP payload header size for IVAS is calculated as follows:

- Add 1 byte for the Table of Content (ToC)

- Add 1 byte for the initial E byte

- Based on the session negotiation, add bytes to the payload header size based on Tables Z.3.1-1, Z.3.1-2 and Z.3.1-3

The payload header bitrate in kilobits per second is calculated by multiplying the IVAS RTP payload header size in bytes by 400 (assuming 50 frames per second and converting one byte to 8 bits).

Table Z.3.1-1: IVAS bandwidth change request session conditions and effect to payload header size

|  |  |  |
| --- | --- | --- |
| Session condition | Bandwidth change request | Total addition |
| ibw or ibw-send lists multiple values or not present | Enabled | 1 byte |
| ibw or ibw-send lists a single value | Disabled | 0 bytes |

Table Z.3.1-2: IVAS coded format and sub-format change request session conditions and effect to payload header size

|  |  |  |  |
| --- | --- | --- | --- |
| Session condition | Format change request | Sub-format change request | Total addition |
| cf-sub-info lists multiple values or not present | Enabled | Enabled | 2 bytes |
| cf-sub-info lists a single value for each coded format and cf-send lists multiple values | Enabled | Disabled | 1 byte |
| cf-sub-info lists a single value and cf-send lists a single value | Disabled | Disabled | 0 bytes |

Table Z.3.1-3: IVAS PI data indication signalling session conditions and effect to payload header size

|  |  |  |
| --- | --- | --- |
| Session condition | PI indication signalling | Total addition |
| PI data supported for the session | Enabled | 1 byte |
| PI data not supported for the session | Disabled | 0 bytes |

## Z.3.2 Payload header bitrate for SR session

The RTP payload header size for SR IVAS is calculated as follows:

- Add 2 bytes for the Table of Content (ToC)

- Add 1 byte for the initial E byte

- Based on the session negotiation, add bytes to the payload header size based on Tables Z.3.1-1, Z.3.1-3 and Z.3.2-1

The payload header bitrate in kilobits per second is calculated by multiplying the IVAS RTP payload header size in bytes by 400 (assuming 50 frames per second and converting one byte to 8 bits).

The coded format and sub-format change requests are always exluded in split rendering sessions in the receive direction because only split rendering mode is used in the send direction.

Table Z.3.2-1: IVAS split rendering request session conditions and effect to payload header size

|  |  |  |
| --- | --- | --- |
| Session condition | Split rendering request | Total addition |
| sr-dof indicates a diegetic stream (value of 0, 1, 2 or 3) | Enabled | 1 byte |
| sr-dof indicates a single non-diegetic stream (value of -1) | Disabled | 0 bytes |

==============End of change==============